WHAT IS CLAIMED IS:

1. An optical node device applicable to an optical network including a closed loop provided by an optical fiber, comprising:

a tunable wavelength selecting element adapted to input WDM signal light obtained by wavelength division multiplexing a plurality of optical signals having different wavelengths, the tunable wavelength selecting element having a function of dropping at least one optical signal from the WDM signal light and a function of adding at least one optical signal to at least one unassigned wavelength channel of the WDM signal light; and

a wavelength selecting filter optically connected to said tunable wavelength selecting element for removing noise present in any bands other than a signal band of each optical signal passing through said tunable wavelength selecting element.

2. An optical node device according to claim 1, wherein:

said wavelength selecting filter comprises an interleaver having an input port and first and second output ports, and an optical coupler having first and second input ports and an output port, said first and

second input ports of said optical coupler being optically connected to said first and second output ports of said interleaver, respectively;

said interleaver and said optical coupler being arranged along said closed loop.

3. An optical node device according to claim 2, wherein:

said WDM signal light has a plurality of wavelength channels arranged at substantially equal intervals in the wavelength domain;

said input port and said first output port of said interleaver are coupled by a transmission band including the wavelength of any odd-numbered one of said wavelength channels; and

said input port and said second output port of said interleaver are coupled by a transmission band including the wavelength of any even-numbered one of said wavelength channels.

4. An optical node device according to claim 1, wherein:

said wavelength selecting filter comprises an optical demultiplexer having an input port and first to N-th (N is an integer satisfying 1 < N) output ports, and an optical multiplexer having first to N-th input ports

and an output port, said first to N-th input ports of said optical multiplexer being optically connected to said first to N-th output ports of said optical demultiplexer, respectively;

said optical demultiplexer and said optical multiplexer being arranged along said closed loop.

5. An optical node device according to claim 4, wherein:

said WDM signal light has a plurality of wavelength channels arranged at substantially equal intervals in the wavelength domain;

said input port and said i-th (i is an integer satisfying $1 \leqq i \leqq N$) output port of said optical demultiplexer are coupled by a transmission band including the wavelength of any one of said wavelength channels;

said j-th (j is an integer satisfying $1 \leqq j \leqq N$) input port and said output port of said optical multiplexer are coupled by a transmission band including the wavelength of any one of wavelength channels.

6. An optical node device according to claim 5, wherein said transmission band of each of said optical demultiplexer and said optical multiplexer per wavelength channel has a central wavelength substantially coinciding

with the central wavelength of each wavelength channel of said WDM signal light.

7. An optical node device according to claim 5, wherein said transmission band of each of said optical demultiplexer and said optical multiplexer per wavelength channel is wider than the band of each wavelength channel of said WDM signal light.

8. An optical node device according to claim 7, wherein:

said transmission band of said optical demultiplexer per wavelength channel has a central wavelength substantially coinciding with a first wavelength shorter than the central wavelength of each wavelength channel of said WDM signal light; and

said transmission band of said optical multiplexer per wavelength channel has a central wavelength substantially coinciding with a second wavelength longer than the central wavelength of each wavelength channel of said WDM signal light.

9. An optical node device according to claim 4, wherein each of said optical demultiplexer and said optical multiplexer comprises an arrayed waveguide grating.

10. An optical node device according to claim 1,

wherein said tunable wavelength selecting element comprises an acousto-optic tunable filter.

11. An optical node device according to claim 1, wherein said tunable wavelength selecting element has a first input port for inputting said WDM signal light, a second input port for inputting an optical signal to be added to said WDM signal light, a first output port for outputting an optical signal to be passed through said tunable wavelength selecting element, and a second output port for outputting an optical signal to be dropped from said WDM signal light.

12. An optical node device according to claim 11, further comprising:

an optical coupler having a plurality of input ports and an output port connected to said second input port of said tunable wavelength selecting element;

an optical modulator connected to each of said plurality of input ports of said optical coupler; and

a tunable light source connected to said optical modulator.

13. An optical node device according to claim 11, further comprising:

an optical coupler having an input port connected to said second output port of said tunable wavelength

selecting element, and a plurality of output ports;

a tunable filter connected to each of said plurality of output ports of said optical coupler; and

an optical receiver connected to said tunable filter.

14. An optical node device according to claim 1, further comprising an optical amplifier connected to said tunable wavelength selecting element.

15. A system comprising:

a closed loop provided by an optical fiber; and

a plurality of optical node devices arranged along said closed loop;

at least one of said plurality of optical node device comprising:

a tunable wavelength selecting element adapted to input WDM signal light obtained by wavelength division multiplexing a plurality of optical signals having different wavelengths, said tunable wavelength selecting element having a function of dropping at least one optical signal from said WDM signal light and a function of adding at least one optical signal to at least one unassigned wavelength channel of said WDM signal light; and

a wavelength selecting filter optically connected

to said tunable wavelength selecting element for removing noise present in any bands other than a signal band of each optical signal passing through said tunable wavelength selecting element.

16. A system according to claim 15, further comprising at least one optical amplifier arranged along said closed loop.

17. A system according to claim 15, wherein said tunable wavelength selecting element has a first input port for inputting said WDM signal light, a second input port for inputting an optical signal to be added to said WDM signal light, a first output port for outputting an optical signal to be passed through said tunable wavelength selecting element, and a second output port for outputting an optical signal to be dropped from said WDM signal light.

18. A system according to claim 17, wherein said at least one optical node device further comprises:

an optical coupler having a plurality of input ports and an output port connected to said second input port of said tunable wavelength selecting element;

an optical modulator connected to each of said plurality of input ports of said optical coupler; and

a tunable light source connected to said optical

modulator.

19. A system according to claim 17, wherein said at least one optical node device further comprises:

an optical coupler having an input port connected to said second output port of said tunable wavelength selecting element, and a plurality of output ports;

a tunable filter connected to each of said plurality of output ports of said optical coupler; and

an optical receiver connected to said tunable filter.

20. An optical node device applicable to an optical network including a closed loop provided by an optical fiber, comprising:

an optical demultiplexer having an input port for inputting WDM signal light obtained by wavelength division multiplexing N (N is an integer satisfying 1 < N) optical signals having different wavelengths and N output ports for respectively outputting said N optical signals separated from said WDM signal light;

N 2 x 2 optical switches each having first and second input ports and first and second output ports, said N optical signals output from said optical demultiplexer being supplied to said first input ports of said N 2 x 2 optical switches, respectively, each of said

N 2 x 2 optical switches switching between a bar state where said first and second input ports are connected to said first and second output ports, respectively, and a cross state where said first and second input ports are connected to said second and first output ports, respectively; and

an optical multiplexer having N input ports for respectively inputting N optical signals output from said first output ports of said N 2 x 2 optical switches, and an output port for outputting WDM signal light obtained by wavelength division multiplexing said N optical signals input to said N input ports.

21. An optical node device according to claim 20, wherein:

said WDM signal light has a plurality of wavelength channels arranged at substantially equal intervals in the wavelength domain;

said input port and said i-th (i is an integer satisfying $1 \leqq i \leqq N$) output port of said optical demultiplexer are coupled by a transmission band including the wavelength of any one of said wavelength channels;

said j-th (j is an integer satisfying $1 \leqq j \leqq N$) input port and said output port of said optical

multiplexer are coupled by a transmission band including the wavelength of any one of wavelength channels.

22. An optical node device according to claim 21, wherein said transmission band of each of said optical demultiplexer and said optical multiplexer per wavelength channel has a central wavelength substantially coinciding with the central wavelength of each wavelength channel of said WDM signal light.

23. An optical node device according to claim 21, wherein said transmission band of each of said optical demultiplexer and said optical multiplexer per wavelength channel is wider than the band of each wavelength channel of said WDM signal light.

24. An optical node device according to claim 23, wherein:

said transmission band of said optical demultiplexer per wavelength channel has a central wavelength substantially coinciding with a first wavelength shorter than the central wavelength of each wavelength channel of said WDM signal light; and

said transmission band of said optical multiplexer per wavelength channel has a central wavelength substantially coinciding with a second wavelength longer than the central wavelength of each wavelength channel of

said WDM signal light.

25. An optical node device according to claim 20, further comprising:

a plurality of optical transmitters for outputting optical signals to be added to any unassigned channels of said WDM signal light supplied to said optical demultiplexer; and

an optical switch for switching the connections between said plurality of optical transmitters and said second input ports of said N 2 x 2 optical switches.

26. An optical node device according to claim 20, further comprising:

a plurality of optical receivers for receiving optical signals dropped from said WDM signal light supplied to said optical demultiplexer; and

an optical switch for switching the connections between said plurality of optical receivers and said second output ports of said N 2 x 2 optical switches.

27. A system comprising:

a closed loop provided by an optical fiber; and

a plurality of optical node devices arranged along said closed loop;

at least one of said plurality of optical node devices comprising:

an optical demultiplexer having an input port for inputting WDM signal light obtained by wavelength division multiplexing N (N is an integer satisfying 1 < N) optical signals having different wavelengths and N output ports for respectively outputting said N optical signals separated from said WDM signal light;

N 2 x 2 optical switches each having first and second input ports and first and second output ports, said N optical signals output from said optical demultiplexer being supplied to said first input ports of said N 2 x 2 optical switches, respectively, each of said N 2 x 2 optical switches switching between a bar state where said first and second input ports are connected to said first and second output ports, respectively, and a cross state where said first and second input ports are connected to said second and first output ports, respectively; and

an optical multiplexer having N input ports for respectively inputting N optical signals output from said first output ports of said N 2 x 2 optical switches, and an output port for outputting WDM signal light obtained by wavelength division multiplexing said N optical signals input to said N input ports.

28. A system according to claim 27, further

comprising at least one optical amplifier arranged along said closed loop.